

CLAIMS:

1. A method for maintaining and using a query index, wherein queries within said query index have predicate intervals, said method comprising:
defining groups of virtual construct intervals; and
inserting each of said predicate intervals into at least one of said groups of said virtual construct intervals.
2. The method in claim 1, wherein each of said groups of virtual construct intervals is adapted to hold multiple predicate intervals, and
wherein said groups of virtual construct intervals have uniform lengths, and
wherein said predicate intervals have non-uniform lengths.
3. The method in claim 1, further comprising maintaining locations of said predicate intervals within said groups of virtual construct intervals using a predicate ID bitmap vector.
4. The method in claim 1, wherein said process of defining said groups of virtual construct intervals comprises beginning all virtual construct intervals in a group of virtual construct intervals at the same attribute value and ending said virtual construct intervals in said group of virtual construct intervals at different attribute values.
5. The method in claim 1, wherein all of said groups of said virtual construct intervals within said query index have the same pattern of different sized of virtual construct intervals.
6. The method in claim 1, wherein said process of inserting said predicate intervals into said virtual construct intervals, comprises inserting said predicate interval into the same sized virtual construct interval.

7. The method in claim 1, wherein if a predicate interval is larger than any of said virtual construct intervals, said inserting process comprises:
 - inserting an initial portion of said predicate interval into the largest available virtual construct interval, wherein excess length of said predicate interval comprises a remnant predicate interval; and
 - inserting the remnant predicate interval into the same length virtual construct interval.
8. The method in claim 1, wherein event values of said predicate intervals are aligned with the same event values of said virtual construct intervals, such that the same event values of multiple predicate intervals are inserted into the same event value within virtual construct interval.
9. A method for maintaining and using a query index, wherein queries within said query index have predicate intervals, said method comprising:
 - defining groups of virtual construct intervals; and
 - inserting each of said predicate intervals into at least one of said groups of said virtual construct intervals,
 - wherein each of said groups of virtual construct intervals is adapted to hold multiple predicate intervals,
 - wherein said groups of virtual construct intervals have uniform lengths, and
 - wherein said predicate intervals have non-uniform lengths.
10. The method in claim 9, further comprising maintaining locations of said predicate intervals within said groups of virtual construct intervals using a predicate ID bitmap vector.
11. The method in claim 9, wherein said process of defining said groups of virtual construct intervals comprises beginning all virtual construct intervals in a group of virtual construct intervals at the same attribute value and ending said virtual construct intervals in said group of virtual construct intervals at different attribute values.

12. The method in claim 9, wherein all of said groups of said virtual construct intervals within said query index have the same pattern of different sized of virtual construct intervals.
13. The method in claim 9, wherein said process of inserting said predicate intervals into said virtual construct intervals, comprises inserting said predicate interval into the same sized virtual construct interval.
14. The method in claim 9, wherein if a predicate interval is larger than any of said virtual construct intervals, said inserting process comprises:
inserting an initial portion of said predicate interval into the largest available virtual construct interval, wherein excess length of said predicate interval comprises a remnant predicate interval; and
inserting the remnant predicate interval into the same length virtual construct interval.
15. The method in claim 9, wherein event values of said predicate intervals are aligned with the same event values of said virtual construct intervals, such that the same event values of multiple predicate intervals are inserted into the same event value within virtual construct interval.
16. A method for maintaining and using a query index, wherein queries within said query index have predicate intervals, said method comprising:
defining groups of virtual construct intervals; and
inserting each of said predicate intervals into at least one of said groups of said virtual construct intervals,
wherein each of said groups of virtual construct intervals is adapted to hold multiple predicate intervals, and
wherein each of said groups of virtual construct intervals covers a unique group of event values, and wherein said inserting of said predicate values comprises inserting said predicate intervals only into said construct intervals that have corresponding event values.

17. The method in claim 16, further comprising maintaining locations of said predicate intervals within said groups of virtual construct intervals using a predicate ID bitmap vector.
18. The method in claim 16, wherein said process of defining said groups of virtual construct intervals comprises beginning all virtual construct intervals in a group of virtual construct intervals at the same attribute value and ending said virtual construct intervals in said group of virtual construct intervals at different attribute values.
19. The method in claim 16, wherein all of said groups of said virtual construct intervals within said query index have the same pattern of different sized of virtual construct intervals.
20. The method in claim 16, wherein said process of inserting said predicate intervals into said virtual construct intervals, comprises inserting said predicate interval into the same sized virtual construct interval.
21. The method in claim 16, wherein if a predicate interval is larger than any of said virtual construct intervals, said inserting process comprises:
 - inserting an initial portion of said predicate interval into the largest available virtual construct interval, wherein excess length of said predicate interval comprises a remnant predicate interval; and
 - inserting the remnant predicate interval into the same length virtual construct interval.
22. The method in claim 16, wherein event values of said predicate intervals are aligned with the same event values of said virtual construct intervals, such that the same event values of multiple predicate intervals are inserted into the same event value within virtual construct interval.
23. A method for maintaining and using a query index, wherein queries within said query index have predicate intervals, said method comprising:
 - defining groups of virtual construct intervals;

inserting each of said predicate intervals into at least one of said groups of said virtual construct intervals,

wherein each of said groups of virtual construct intervals is adapted to hold multiple predicate intervals, and wherein each of said groups of virtual construct intervals covers a unique group of event values,

wherein said inserting of said predicate values comprises inserting said predicate intervals only into said construct intervals that have corresponding event values, and

wherein said defining process only defines virtual construct intervals that are between the minimum and maximum possible attribute values of said predicate intervals.

24. The method in claim 23, further comprising maintaining locations of said predicate intervals within said groups of virtual construct intervals using a predicate ID bitmap vector.

25. The method in claim 23, wherein said process of defining said groups of virtual construct intervals comprises beginning all virtual construct intervals in a group of virtual construct intervals at the same attribute value and ending said virtual construct intervals in said group of virtual construct intervals at different attribute values.

26. The method in claim 23, wherein all of said groups of said virtual construct intervals within said query index have the same pattern of different sized of virtual construct intervals.

27. The method in claim 23, wherein said process of inserting said predicate intervals into said virtual construct intervals, comprises inserting said predicate interval into the same sized virtual construct interval.

28. The method in claim 23, wherein if a predicate interval is larger than any of said virtual construct intervals, said inserting process comprises:

inserting an initial portion of said predicate interval into the largest available virtual construct interval, wherein excess length of said predicate interval comprises a remnant predicate interval; and

inserting the remnant predicate interval into the same length virtual construct interval.

29. The method in claim 23, wherein event values of said predicate intervals are aligned with the same event values of said virtual construct intervals, such that the same event values of multiple predicate intervals are inserted into the same event value within virtual construct interval.

30. A service adapted to maintains and use a query index, wherein queries within said query index have predicate intervals, said service:

defining groups of virtual construct intervals; and

inserting each of said predicate intervals into at least one of said groups of said virtual construct intervals,

wherein each of said groups of virtual construct intervals is adapted to hold multiple predicate intervals, and

wherein each of said groups of virtual construct intervals covers a unique group of event values, and wherein said inserting of said predicate values comprises inserting said predicate intervals only into said construct intervals that have corresponding event values.

31. The service in claim 30, further comprising maintaining locations of said predicate intervals within said groups of virtual construct intervals using a predicate ID bitmap vector.

32. The service in claim 30, wherein said process of defining said groups of virtual construct intervals comprises beginning all virtual construct intervals in a group of virtual construct intervals at the same attribute value and ending said virtual construct intervals in said group of virtual construct intervals at different attribute values.

33. The service in claim 30, wherein all of said groups of said virtual construct intervals within said query index have the same pattern of different sized of virtual construct intervals.

34. The service in claim 30, wherein said process of inserting said predicate intervals into said virtual construct intervals, comprises inserting said predicate interval into the same sized virtual construct interval.

35. The service in claim 30, wherein if a predicate interval is larger than any of said virtual construct intervals, said inserting process comprises:

inserting an initial portion of said predicate interval into the largest available virtual construct interval, wherein excess length of said predicate interval comprises a remnant predicate interval; and

inserting the remnant predicate interval into the same length virtual construct interval.

36. The service in claim 30, wherein event values of said predicate intervals are aligned with the same event values of said virtual construct intervals, such that the same event values of multiple predicate intervals are inserted into the same event value within virtual construct interval.

37. A system for maintaining and using a query index, wherein queries within said query index have predicate intervals, said system comprising:

a plurality of bitmap vectors which define groups of virtual construct intervals;

a predicate insertion handler adapted to insert each of said predicate intervals into at least one of said groups of said virtual construct intervals,

wherein each of said groups of virtual construct intervals is adapted to hold multiple predicate intervals, and

wherein each of said groups of virtual construct intervals covers a unique group of event values, and wherein said inserting of said predicate values comprises inserting said predicate intervals only into said construct intervals that have corresponding event values.

38. The system in claim 37, further comprising a predicate ID bitmap vector adapted to maintain locations of said predicate intervals within said groups of virtual construct intervals.

39. The system in claim 37, wherein all virtual construct intervals in a group of virtual construct intervals begin at the same attribute value and end at different attribute values.
40. The system in claim 37, wherein all of said groups of said virtual construct intervals have the same pattern of different sized of virtual construct intervals.
41. The system in claim 37, wherein said predicate insertion handler inserts said predicate intervals into the same sized virtual construct intervals.
42. The system in claim 37, wherein if a predicate interval is larger than any of said virtual construct intervals, said predicate insertion handler:
inserts an initial portion of said predicate interval into the largest available virtual construct interval, wherein excess length of said predicate interval comprises a remnant predicate interval; and
inserts the remnant predicate interval into the same length virtual construct interval.
43. The system in claim 37, wherein event values of said predicate intervals are aligned with the same event values of said virtual construct intervals, such that the same event values of multiple predicate intervals are inserted into the same event value within virtual construct interval.
44. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform a method for maintaining and using a query index, wherein queries within said query index have predicate intervals, said method comprising:
defining groups of virtual construct intervals; and
inserting each of said predicate intervals into at least one of said groups of said virtual construct intervals,
wherein each of said groups of virtual construct intervals is adapted to hold multiple predicate intervals, and

wherein said groups of virtual construct intervals have uniform lengths, and
wherein said predicate intervals have non-uniform lengths.

45. The program storage device in claim 44, wherein said method further comprises maintaining locations of said predicate intervals within said groups of virtual construct intervals using a predicate ID bitmap vector.

46. The program storage device in claim 44, wherein said process of defining said groups of virtual construct intervals comprises beginning all virtual construct intervals in a group of virtual construct intervals at the same attribute value and ending said virtual construct intervals in said group of virtual construct intervals at different attribute values.

47. The program storage device in claim 44, wherein all of said groups of said virtual construct intervals within said query index have the same pattern of different sized of virtual construct intervals.

48. The program storage device in claim 44, wherein said process of inserting said predicate intervals into said virtual construct intervals, comprises inserting said predicate interval into the same sized virtual construct interval.

49. The program storage device in claim 44, wherein if a predicate interval is larger than any of said virtual construct intervals, said inserting process comprises:

inserting an initial portion of said predicate interval into the largest available virtual construct interval, wherein excess length of said predicate interval comprises a remnant predicate interval; and

inserting the remnant predicate interval into the same length virtual construct interval.

50. The program storage device in claim 44, wherein event values of said predicate intervals are aligned with the same event values of said virtual construct intervals, such that the same

event values of multiple predicate intervals are inserted into the same event value within virtual construct interval.